

**ANQUAMINE® 701** Curing Agent**DESCRIPTION**

Anquamine 701 is a water-based epoxy curing agent that lets you create unique microporous systems that are breathable and water vapor permeable preventing delamination and blistering. This means floors can be laid and returned to service quickly, without the extra costs involved with reducing moisture content of the concrete. It is based on a polymeric emulsion and, as a result, provides superior performance for a wide range of applications. It has been developed primarily for use with liquid epoxy resins, out-performing solid resin emulsion-based systems by offering the capability to formulate systems with zero VOC and without resin emulsifiers.

**ADVANTAGES**

- Flooring systems with high permeability— 100 times greater than typical cycloaliphatic-based systems
- Excellent adhesion to green concrete after only 24 hours of cure
- Very fast film drying with liquid epoxy, and fast through-cure even at low temperatures (down to 5°C)
- Visible end of pot-life as evidenced by a rapid increase in viscosity
- Low viscosity
- Low-cost systems based on high filler levels, particularly in flooring applications
- Very low free-amine content
- Very good early water resistance
- Temperature and shear-stable

**SHELF LIFE**

At least 24 months from the date of manufacture in the original sealed container at ambient temperature. Store away from excessive heat and humidity in tightly closed containers. Do not freeze.

**STORAGE AND HANDLING**

Refer to the Safety Data Sheet on Anquamine 701 curing agent.

**TYPICAL CURE SCHEDULE**

7 days at ambient temperature.

**TYPICAL PROPERTIES**

<b>Appearance</b>	Opaque Yellow Emulsion
<b>Viscosity @ 77°F (cPs)</b>	5,000-10,000
<b>Amine Value (mg KOH/g)</b>	130-165
<b>Specific Gravity @ 77°F</b>	1.08
<b>Equivalent Wt/{H}</b>	300
<b>Total Solids Content (wt %)</b>	53-57
<b>Recommended Use Level, (phr EEW 190)</b>	140-170

**TYPICAL HANDLING PROPERTIES\***

<b>Pot Life (EEW=190)</b>	2-5
<b>Dry Time (BK Recorder), h</b>	
<b>Phase 1</b>	0.75
<b>Phase 2</b>	4.00
<b>Phase 3</b>	6.50
<b>PersoZ Hardness@ 24 hours</b>	200
<b>@ 7 days</b>	350

\* Anquamine 701 curing agent with standard Bisphenol-A based (DGEBA, EEW=190) epoxy resin.

## ANQUAMINE® 701 SELF-LEVELING FLOOR STARTING POINT FORMULATION

A Side	Pounds	Gallons	Gallons
Anquamine 701	11.00	1.20	Evonik
Anquamine 401	2.50	0.27	Evonik
Byk 045	0.70	0.08	Byk Chemie
TiPure R-960 (TiO <sub>2</sub> )	3.80	0.11	DuPont
DI Water	9.10	1.09	—
Cimbar 325	36.00	1.01	Cimbar
Sil-Co-Sil 63	18.00	0.82	US Silica
Quartz Sand [F-110] (150μ)	9.20	0.42	US Silica
Quartz Sand [#1 Dry] (300μ)	9.30	0.42	US Silica
Xanthan Gum FN (3% water)	0.40	0.005	VL Clark Chemicals
<b>Total A Side</b>	<b>100.00</b>	<b>5.47</b>	
<b>B Side</b>			
Epoxy (EEW = 190)	10.00	1.03	Various
<b>Total B Side</b>	<b>10.00</b>	<b>1.03</b>	
<b>Total</b>	<b>110.00</b>	<b>6.51</b>	

### FORMULATING PROPERTIES

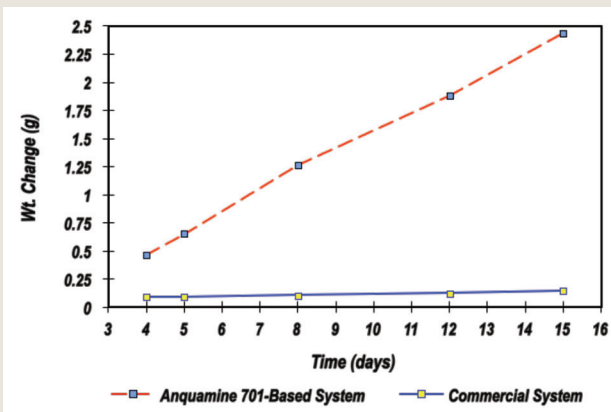
VOC (lb/gal)	0.0
Volume Solids (%)	70.6
PVC (%)	60.7
Weight/gallon, A Side	18.26
Weight/gallon, B Side	9.70
Weight/gallon (admix)	16.90
Handling Time @ 75°F (min)	45
Volume Shrinkage (max)	<5%
Water Content (wt %)	15.0
Filler: Binder Ratio	4:2:1

### PERFORMANCE PROPERTIES

Water Vapor Permeability	0.15 perm in.
Hardness (Shore D) (1 day)	70
Hardness (Shore D) (14 days)	80
Flow Out (cm)	15.9
Surface Appearance	Matt
Coefficient of Friction	0.28
Abrasion Resistance [wt loss (mg/1000 cycles)]	156
Bond Strength on Concrete (psi)	500

### WATER VAPOR TRANSMISSION THROUGH SELF-LEVELING FLOORS

#### Permeability Measurements ASTM E96-95 (wet cup)



#### Water Vapor Permeability Self-Leveling Floors

	Anquamine 701 System	Cycloaliphatic System
Water Vapor Transmission	$9.75 \times 10^{-4}$	$6.48 \times 10^{-6}$
Water Vapor Permeability	$6.67 \times 10^{-7}$	$4.69 \times 10^{-9}$

Anquamine 701 Self-Leveling System Permeability:  
100x Cycloaliphatic System

## IMPACT OF PRIMER AND/OR TOPCOAT ON THE MOISTURE VAPOR TRANSMISSION CAPABILITY OF AN ANQUAMINE 701-BASED SELF-LEVELING FLOOR

Permeable Primer Formulation	Weight %
Epilink® 360	36.7
Deionized Water	18.4
Glacial Acetic Acid	1.5
Ancarez™ 718NC*	31.1
Deionized Water	12.3

Permeable Top Coat Formulation	Weight %
Ancamine 1618	36.1
Ancarez 718NC*	63.9

\*Ancarez 718NC is a standard liquid epoxy resin with 18% Epodil® 748 diluent.

- The primer was evaluated at 4 mil DFT.
- The primer was moisture-free prior to subsequent applications.
- The topcoat was evaluated at 4 mil DFT.
- The self-leveling floor formulation was moisture-free prior to application of the topcoat.
- All formulations were evaluated with a 1/8" thick Anquamine 701-based self-leveling floor formulation.

### Comments

- The Epilink 360-based primer formulation combined with the self-leveling floor maintained >95% of the moisture vapor transmission capability of the self-leveling floor formulation outlined above.

The Ancamine 1618-based topcoat formulation combined with the Epilink 360-based primer formulation and the self-leveling floor maintained >95% of the moisture vapor transmission capability of the self-leveling floor formulation outlined above.

## APPLICATION OF ANQUAMINE 701 SELF-LEVELING FLOOR FORMULATION

**On Green Concrete:** Conventional epoxy flooring and coating formulations for concrete require a 28-day waiting period from the time of the concrete pour to application. The Anquamine 701 development program has demonstrated flooring systems that exhibit excellent bond strength to green concrete, addressing the market demand for a faster return to service and minimal down time.

**Test Protocol:** Concrete slabs were poured into forms with a bottom plastic liner. The slabs were finished by 1) Steel trowel\*, 2) Broom finish\*\*, and 3) Mild shot blast after three days\*\*. The slabs were cured for 24 hours, the forms were removed, and the sides were sealed with a 100% solids epoxy formulation. The Anquamine 701-based self-leveling formulation (outlined below) was then applied to the top of the slab (application was done in 3 days for the shot blast finish). The bond strength to the concrete slab was tested after 7-day and 30-day cures for the self-leveling floor formulation.

Concrete Formulation 1*	
Cement	470 lb
Fly ash	100 lb
Fine Aggregate	1420 lb
Coarse Aggregate	1850 lb
Water	30.8 gal
Admixture	17.1 oz
W/C ratio = 0.45	

Concrete Formulation 2**	
Cement	470 lb
Fine Aggregate	1450 lb
Coarse Aggregate	1900 lb
Water	34 gal
W/C ratio = 0.60	

**ANQUAMINE® 701 Curing Agent****1/8 INCH SELF-LEVELING FLOOR FORMULATION (BY WEIGHT) APPLIED TO GREEN CONCRETE**

<b>Anquamine 701</b>	11.0
<b>Anquamine 401</b>	2.5
<b>BYK-045</b>	0.7
<b>TiPure® R-960</b>	3.8
<b>Water</b>	9.1
<b>Cimbar 325</b>	36.0
<b>Sil-Co-Sil 63</b>	18.0
<b>Quartz Sand [F-110] (150m)</b>	9.2
<b>Quartz Sand [#1 dry] (300m)</b>	9.3
<b>Xanthan Gum (3% in water)</b>	0.4
<b>Epoxy Resin (190EEW)</b>	10.0

**BOND STRENGTH RESULTS (PSI)**

<b>7-Day Formulation Cure</b>	<b>Concrete Finish</b>		
	<b>Steel Trowel</b>	<b>Broom</b>	<b>Mild Shot Blast</b>
Concrete Control	—	155	140
Anquamine 701 Self-Leveling Floor	419	300	300
<b>30-Day Formulation Cure</b>			
Concrete Control	—	98	278
Anquamine 701 Self-Leveling Floor	531	385	317

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